A 12 Year Temperature and Wind Speed Climatology for the Marshall Field Site near Boulder, Colorado 2006-2018

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Introduction

The Denver-Boulder region in Colorado is located on the border of two distinct weather regimes, the Rocky Mountains to the west and the Great Plains to the east. This region experiences inclement and sometimes unpredictable weather events, which can be accompanied by changes in temperatures and wind speed. To better understand the climate for the region, nearly 12 years of temperature and wind speed data from the Marshall Field Site were analyzed to assess changes in these parameters over time.

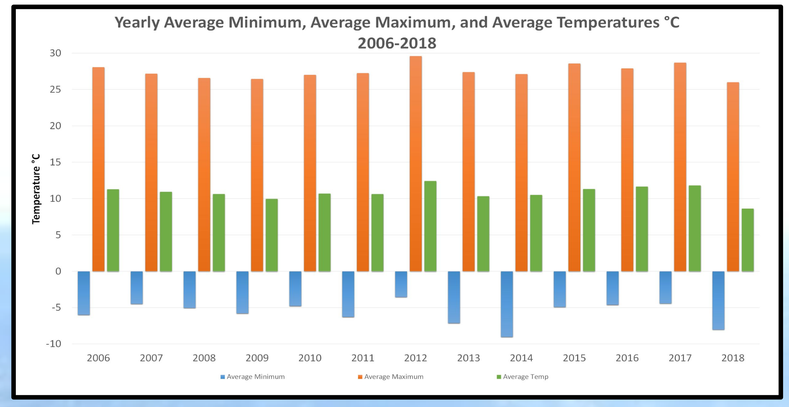
Photo: Instrumentation at the Marshall Field Site

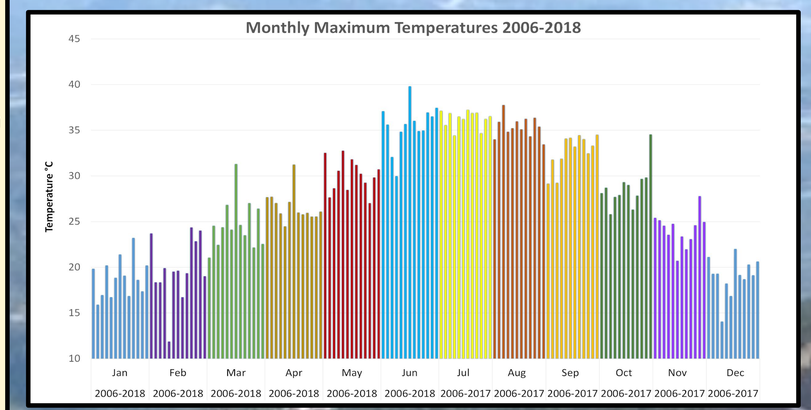
Methods

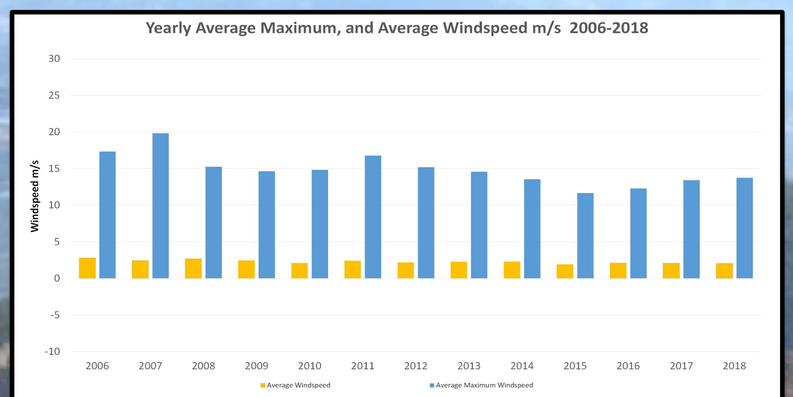
- Temperature recordings were primarily taken from a CS-500L probe, with data gaps filled in from a Lufft WS600 and a Hotplate sensor
- Wind speed was primarily recorded from a R.M. Young Wind monitor with data gaps filled in from a Lufft WS600 and a Hotplate sensor
- All measurements occurred at the Marshall Field Site near Boulder, CO
- Raw temperature and wind speed data values were recorded by the various instruments once per minute
- A script was developed in the Perl scripting language to filter bad data, and to find and calculate the monthly minimum, maximum, and average values for both temperature in °C and wind speed in m/s
- Available data spans from January 01, 2006 to June 31, 2018

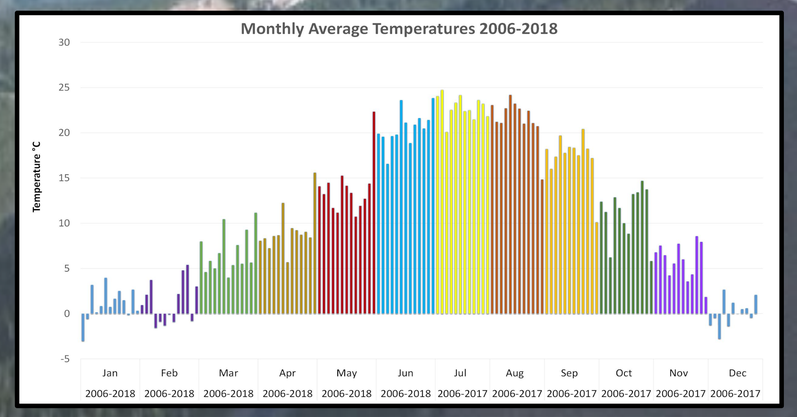
Conclusions

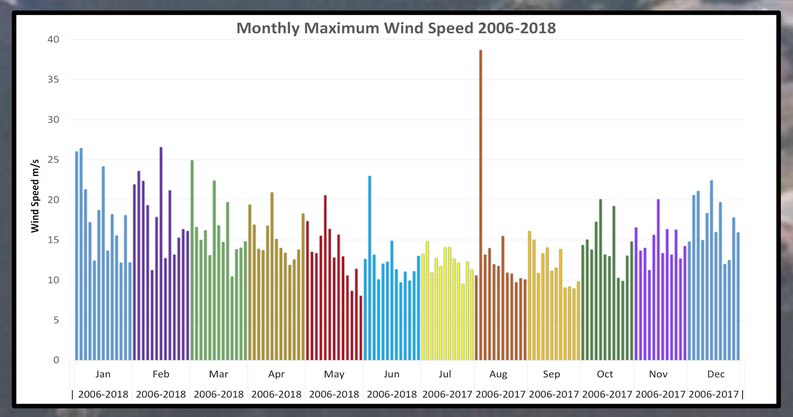
- Yearly average temperature has been mostly steady
- 2012 had the highest average maximum temperature
- Monthly average temperatures are generally increasing each year in the spring and fall
- Average wind speeds are generally decreasing for all months
- Not much overall change since 2006 in average low temperature extremes

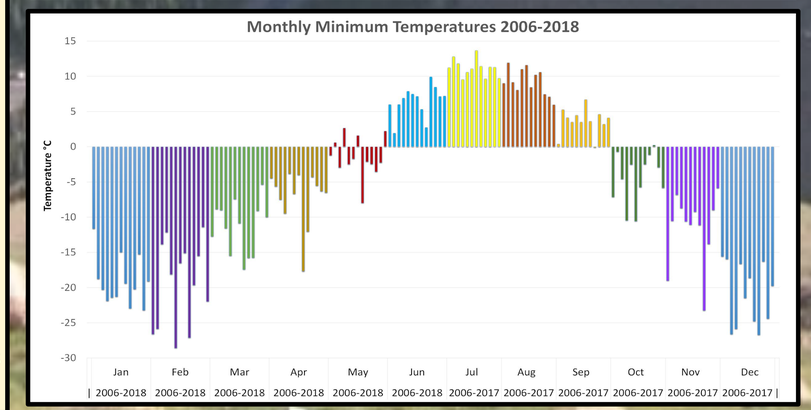


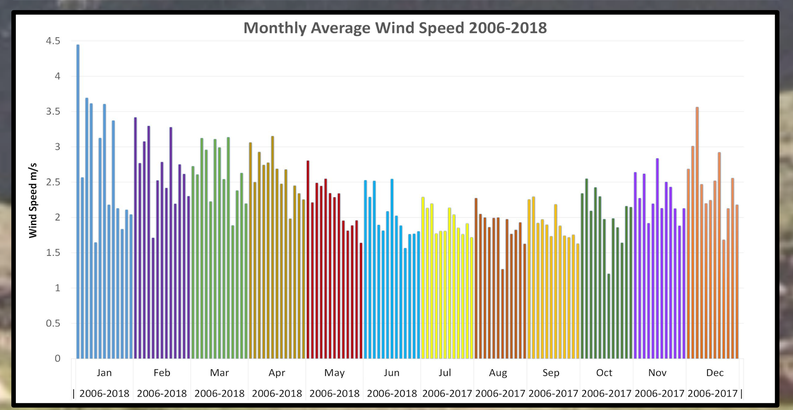












Conclusions (cont'd)

- Autumn low temperatures are getting less extreme
- Wind speed extremes have decreased slightly for all months on average
- 138 months is not enough time show clear patterns in climatic cycles
- At least 20-30 years of data might begin to show more clear patterns and/or stronger trends even with some missing monthly data points

Future Work

- Extend timespan back to beginning of data set in 1996 and filter out data gaps and recording errors
- Continue measurements and work to improve reliability of instruments
- Expand and compare these data to other data sets such as precipitation, humidity and wind direction

Acknowledgments

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